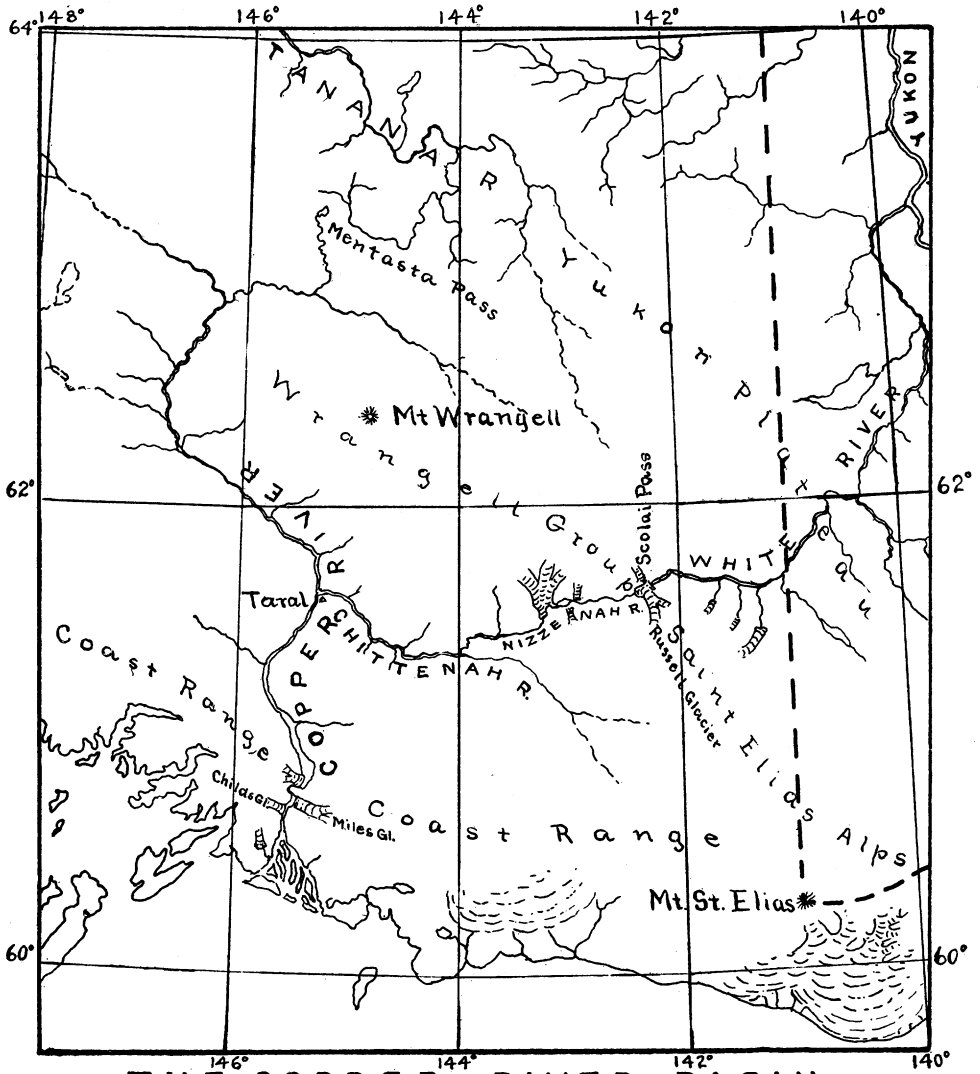


THE COPPER RIVER BASIN

Scale 0 20 40 60 80 Stat. Miles.

COPPER RIVER AS A ROUTE TO THE YUKON BASIN.

BY

C. WILLARD HAYES.

The experiences of the past season on the lower Yukon and the trails leading into the interior from the head of Lynn Canal have shown conclusively that the present means of access to the Yukon basin are wholly inadequate to the demands already made upon them. The demands of the near future will be vastly greater, and much attention is being directed to the possibilities of routes with reference to the construction of wagon and rail roads. From an inspection of the map of North America the Copper River appears to offer a direct and easy route, and numerous accounts of projects for utilizing it have been published in the newspapers. In view of the serious results which are liable to follow mistaken ideas as to the character of the river and the passes leading from its headwaters to tributaries of the Yukon, it seems desirable that all available information concerning it should be made public.

The Copper River was ascended by the Russian trader, Seréberinikoff, in 1847, to a point about 60 miles above Taral, where he was murdered by the natives, but his notes were brought back to the coast, and, although meagre, they for many years formed the only source of authentic information on the region. In 1884 a party under Lieutenant Abercrombie was sent out by General Miles, then commanding the department, to explore the river. He succeeded in ascending only a few miles above the head of the delta, and was turned back by the lateness of the season and the obstacles which he met there.

The following year a party was organized under the command of Lieutenant Allen. On account of the difficulties of ascending the river by boat, which Abercrombie had encountered, he determined to go up before the ice went out of the river, carrying his outfit on sledges. Owing to various causes his departure from the coast was delayed until the snow and ice had become soft, so that he encountered severe hardships on the journey, but by almost superhuman efforts was able to reach Taral before the ice on the river became entirely impassable.

From Taral he went eastward up the Chittenah, the east branch of the Copper River, for about 75 miles. He there found Nicolai,

the chief of the Copper River Indians, and, obtaining from him a crudely built boat, he descended the east fork, and continued his journey up the main Copper River to the Mentasta pass, by which he crossed the divide to the Tanana. The account of this remarkable trip of Lieutenant Allen, published in 1887, contains practically all the available information concerning Copper River. Inasmuch as he traversed the lower part of the river, where the most serious obstacles to navigation occur, before the ice was out and while the country was still covered with snow, he was unable to obtain much information as to the practicability of its navigation. Since Lieut. Allen's explorations, the river has been ascended varying distances by an occasional prospector or trader, but no record has ever been published of their experiences or observations.

The problem of utilizing the Copper River as a route to the Yukon basin may be divided into a consideration of the river itself and the Mentasta and Scolai passes leading from its headwaters to the interior drainage. The passes will be considered first.

Mentasta pass has been described by Lieut. Allen. It lies almost due north of Mount Wrangell and leads from the upper part of the main Copper River valley to the headwaters of the Tanana. This region forms a part of the great Yukon plateau, the altitude of which is here between 4,000 and 5,000 ft. It is an undulating upland, above which rise numerous hills and short mountain ranges, though none of the latter carry snow throughout the year. It is sparsely wooded and dotted with innumerable small lakes. This pass, therefore, presents few difficulties to the construction of trails or wagon roads, or even to the building of a railway. It leads, however, only to the Tanana, a river so obstructed by cañons and rapids that its navigation is wholly out of the question, and a route through this pass would have to cross the Tanana and be continued all the way to the Yukon.

Scolai pass is much the more direct route from the coast to the Yukon. It leads from the head of the Nizzenah, an eastern tributary of the Copper River, to the head of White River. Its altitude is about 5,000 ft., or less than 1,000 ft. above the upper White River basin. Unlike the Mentasta pass, it is a deep narrow cut through a lofty mountain range. Much of its northwestern wall is precipitous, the cliffs rising almost vertically from 2,000 to 5,000 ft. From the southeast the magnificent Russell glacier flows down into the pass, and, striking the opposite wall, sends a lobe towards the northeast, from which the White River takes its rise, and another towards the southwest, feeding the Nizzenah. The latter stream continues

for a distance of 50 miles from its source through a deep narrow valley, which is simply a continuation of the pass itself. The high mountains on either side discharge large glaciers into the valley, the ice at one point damming the river and forming a considerable lake. It will be readily seen that this pass, although low and direct, is entirely impracticable for pack animals or as railroad route. Indeed, it is used by the natives only in the winter, when the rivers are frozen and they can travel on snow-shoes, since the steep slopes are covered with a growth of spruce and alder almost impenetrable.

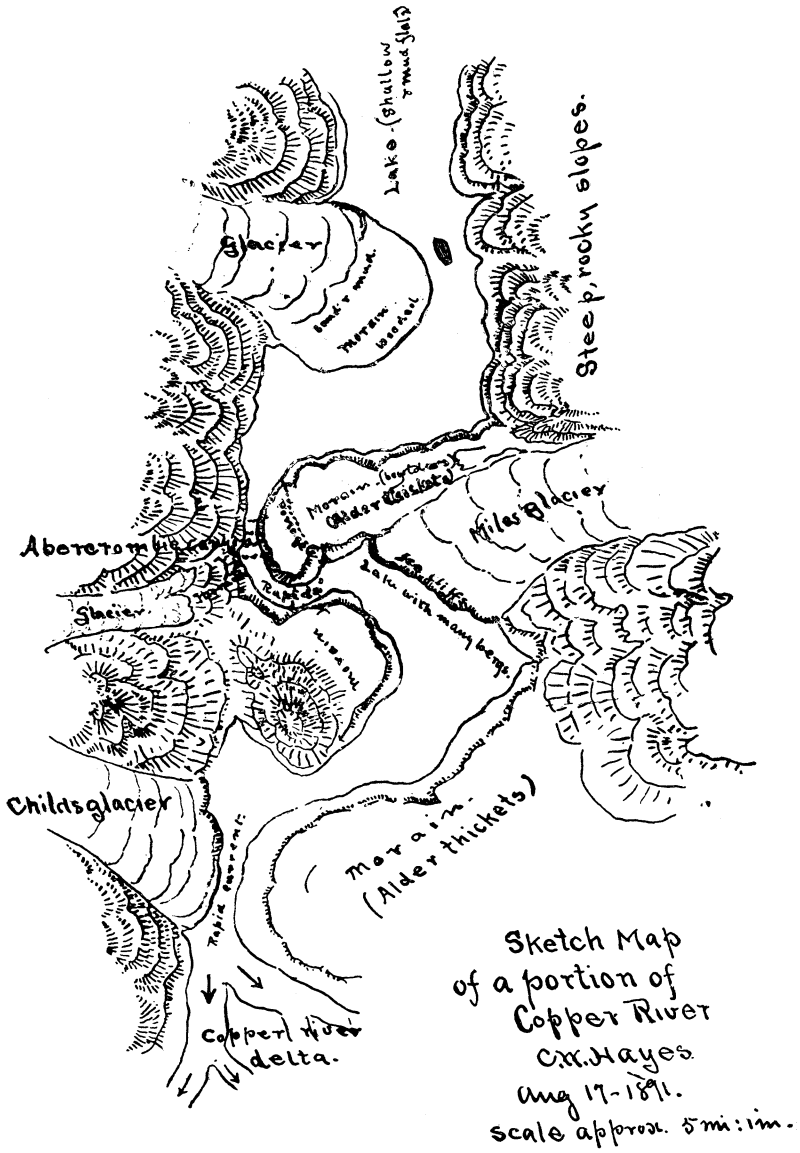
Copper River receives many tributaries above Taral, but is chiefly formed by the confluence of two main branches about 50 miles northwest of Mt. Wrangell. From this point it is a river of considerable size, but rarely flowing in a single channel. It is generally bordered by gravel terraces, 100 to 200 feet in height, between which the river meanders, with a densely timbered flood plain several miles broad. Its channel is interrupted by innumerable islands and bars; the current is swift, and the water is seldom more than a few feet in depth.

The Chittenah River has essentially the same character as this upper portion of the Copper River. In fact, the Chittenah and the first hundred miles of Copper River, above Taral, occupy the axis of the same orographic depression, a broad valley lying between divergent mountain ranges, the coast on the south and the Wrangell group with the connecting spur of the St. Elias Alps on the north. The volume of the Chittenah is nearly equal that of the Copper at their confluence. Although the former has much the smaller drainage basin, it lies partly within the coast belt of heavy precipitation, while the upper portion of the Copper basin lies in the region of scanty rainfall to the north of the Wrangell group. Copper River might probably be navigated by a light steamer about 150 miles above Taral and the Chittenah about half that distance. There are no rapids or rocky obstructions, and the difficulties encountered would be only such as are connected with the navigation of shallow, rapid streams carrying great quantities of coarse sediment. Immediately below Taral the river is contracted greatly and enters a narrow cañon, with abrupt walls 100 feet or more in height. This cañon is something less than a mile in length, and would probably present no serious obstacle to navigation. The current is rapid, but the channel is deep, and there are no obstructions which prevent the descent with a canoe. The difficulty of ascending would be much greater for a small boat, but a steamer of

moderate power would doubtless be able to make the ascent in perfect safety.

Below the cañon the river again spreads out and forms a large number of channels among sand bars and low gravel islands. No boat drawing less than 16 to 18 inches of water would find much difficulty in getting over these bars, as the current is not sufficiently strong to be a serious obstacle, and no bad rapids occur. This character of the river continues for about forty miles. The flood plain of the stream then gradually broadens and the current slackens, with a corresponding decrease in its carrying power and in the size of material deposited. The river here forms a delta in fact, filling a recently formed lake. This slack water extends for a distance of 15 miles. The lower portion is a broad and muddy flat, through which innumerable small streams meander. Beyond the mud flats the river expands into a small lake, the remnant of one originally much larger, but gradually filling up. Below the lake is found the obstruction to which it is due. (This portion of the river is shown on the large-scale sketch map accompanying.) The great excess of precipitation on the southern side of the coast range causes the snow line to approach much nearer sea-level there than in the interior. The lower limit of perpetual snow has a difference in altitude on the opposite sides of the range of something more than 4,000 feet, and this notwithstanding the fact that the mean annual temperature in the interior is many degrees lower than that along the coast. As a consequence of this rise in the snow-line and less abundant precipitation, the glaciers flowing from the northern portions of the range are insignificant compared with those which flow from the southern side. The mountains around Taral do not furnish any glaciers. Descending the river, a few small ones may be seen high up on the mountain sides, but none reach the river valley until near the coast. In descending the river the first one encountered which reaches the valley is a large double glacier coming in from the west. This has pushed its terminal moraine out into the expanded portion of the river, and forms an ice-cliff for a few hundred feet at its northern margin, as shown in the map. For the most part, however, the ice is separated from the river by a broad mud flat. A short distance below a much larger and more active glacier, named by Abercrombie after Gen. Miles, comes in from the east. Within comparatively recent times it doubtless extended entirely across the valley. It has brought down large quantities of rock, and while it had a much greater extension than at the present, its northern lateral moraine was built entirely across the valley.

The ice has since retreated, but this lateral moraine remains and forms the barrier to which the slack water is due. A smaller glacier comes in from the west directly opposite the Miles Glacier,



and the material which it has brought down has assisted in the formation of this dam. The river has been pushed to the extreme

western side of its valley, and for a distance of about two or three miles flows in a shallow cañon whose sides are made up in part of rock, but chiefly of coarse moraine material. The river channel is narrow and the current very rapid over a rough boulder bed. The amount of fall has not been determined, but it is probably between 50 and 100 feet. This was named Abercrombie Cañon by Lieutenant Allen.

From the lower end of the cañon a strong current enters another body of slack water and strikes against the ice-cliffs, which terminate the Miles Glacier. These ice-cliffs are between 200 and 300 feet in height, and are discharging bergs almost continuously. The lake in front of the glacier is filled with these bergs, and is frequently thrown into the most violent commotion by the fall of a large mass of ice. With a strong wind from the south, which is the prevailing direction in summer, the ice is driven into the northern end of the lake, forming a dense pack capable of grinding to pieces any boat which might get caught there. This, together with the current of the river, makes the passing of this lake extremely hazardous, and unless the conditions are favorable the Indians prefer a portage, not only across the moraine on the north, but across the three or four miles as well. It should be said that there is evidence of the rapid recession of the front of Miles Glacier, and this may have gone so far since 1891 as to greatly lessen the danger of passing it. Beyond the front of Miles Glacier the river bears toward the southwest, still with a slack current, and within a few miles strikes the front of the Childs Glacier, which enters the valley from the west.

This presents an ice-cliff to the river only along the northern part of its front, its southern portion descending to the river by a gradual slope. The strong current sweeping past its foot carries off the ice as fast as it falls, so that it does not accumulate as in front of the Miles Glacier, and consequently forms a less serious obstacle. It is not, however, entirely harmless, as a prospector reported that in passing it a large berg was discharged, and the consequent swell overturning his boat carried it far up on the opposite beach.

A short distance below the Childs Glacier the river expands and breaks up into a number of channels between bars of coarse gravel. This is the head of the Copper River delta, which extends for a distance of about 30 miles to deep water. The material deposited becomes rapidly finer, and the lower and more extensive portion consists of broad mud flats.

It appears that there would be no serious difficulty in finding a channel through the delta which could be navigated by light draft steamers.

From the foregoing it will be readily seen that the Copper River presents serious obstacles to navigation. The rapids of the Abercrombie Cañon are, perhaps, the most serious, and it will probably be found quite impossible to ascend them with any kind of a boat. A portage across the main dam of about 2½ miles will then be necessary, to the slack water above Abercrombie Cañon. From this point, 16 to 18 inches of water can be depended upon to the Taral Cañon. Here the current is swift, although the water is deep, so that a boat of considerable power will be required to make the ascent. From Taral northward on the main Copper River, or eastward on the Chittenah, navigation will be attended only by the obstacles everywhere encountered in streams having a rapid fall and overloaded with gravel.

The first, and up to the present time the only, information concerning the pass between the Copper and the White River basins was obtained by the 1891 Schwatka expedition, of which the writer was a member. Considerable information as to the possibility of navigating the Copper River from Taral to the coast, additional to that obtained by Abercrombie and Allen, was also obtained, and most of this has never been published.

The '91 expedition reached Ft. Selkirk, at the confluence of the Pelly and Lewes rivers, via the Taku River, Lake Ahklen, and the Teslin and Lewes rivers. At Ft. Selkirk we secured native packers, who professed to be familiar with the country, and agreed to go with us to the home of the Scolai, on the Copper River. We proceeded overland in a general southwesterly direction, parallel to the main axis of the White River basin, and crossing its numerous southern tributaries. When we reached the northern edge of the Coast, or St. Elias, range, the natives refused to accompany us further, and the party, Lieutenant Schwatka, Mark Russell and the writer, determined to continue alone. We followed the northern base of the St. Elias Mountains some distance westward, and finally discovered a low pass by which we reached the east branch of the Copper River, and thus made our way to the coast.

While the obstacles of navigation outlined above and the nature of the passes will doubtless prevent this from becoming a thoroughfare to the Yukon, the river must still form the chief means of access to a large territory, and one which probably needs only a thorough prospecting to reveal great mineral wealth. It certainly

contains copper, both native and in its various ores, possibly in large amount, and the indications that it contains gold are also good. If the difficulties to be encountered are foreseen and provided for in advance, there should be no great hardship in reaching any part of the Copper River basin.

Finally, a word as to the natives. Much has been said in the papers concerning their treachery and bloodthirstiness. They have had a bad name since the killing of Seréberinikoff, in 1847, but that worthy doubtless merited the fate which he met. The fact that the Indians themselves reported his death and returned his effects to the Russian post is much to their credit. So far as we could judge from ten days' intimate intercourse with them, they are thoroughly trustworthy and honest. They are very much superior to the Pelly and White River Indians in their physique, manner of living and moral standards. Nicolai, the chief of the Taral Indians, is a man of much force of character, and that he is a shrewd trader is nothing to his discredit. It is safe to say that any one going into this country will have nothing whatever to fear from these natives so long as he deals fairly by them. It may be said in their favor that they would probably resent any serious injustice or imposition upon their good nature.

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